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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,429	09/30/2003	JAMES N. HUMENIK	FIS920020186US1	2428
32074 7590 02/05/2007 INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533			EXAMINER GORDON, BRIAN R	
			ART UNIT	PAPER NUMBER
			1743	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/605,429

Applicant(s)

HUMENIK ET AL.

Examiner

Brian R. Gordon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 9-19-06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 36-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 19, 2006 has been entered.

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 36-39, 40, 51, and 56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Markush group of claims 36, 40, and 51 is unclear for the elements of glass ceramic, glass, and borosilicate glass overlap and are not mutually exclusive.

As to claim 37 and 39 it is unclear if the reagent is present in device.

As to claim 38 and 56 it is unclear if the reagent is present in the container.

The following amendments would resolve such issues:

In the claims,

In claim 36 amend step (a) as follows:

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(a) providing a plurality of ceramic layers, said ceramic layers comprised of a material selected from the group consisting of alumina, ~~glass-ceramic~~, aluminum nitride, and glass and ~~borosilicate~~  
~~glass~~;

37. A method according to Claim 36, in which said removable liners ~~is a carrier for~~ carries a reagent thereon, whereby in operation said reagent reacts with a component of an applied fluid.

38. A method according to Claim 36, in which at least one of said at least two vertical passages is connected to a conduit ~~for~~ storing rinsing fluid.

39. A method according to Claim 36, in which a material is adhered ~~adhering~~ to an inner surface of one of said at least two vertical passages and said horizontal channel is ~~a carrier for~~ carries a reagent thereon, whereby in operation said reagent reacts with a substance in an applied fluid.

In claim 40, amend step (a) as follows:

(a) providing a plurality of ceramic layers, said ceramic layers comprised of a material selected from the group consisting of alumina, ~~glass-ceramic~~, aluminum nitride, and glass and ~~borosilicate~~ glass;

In claim 51, amend element (a) as follows:

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(a) a plurality of ceramic layers sintered together, said ceramic layers comprised of a material selected from the group consisting of alumina, ~~glass-ceramic~~, aluminum nitride, and glass and ~~borosilicate glass~~;

56. A sample-holding plate according to claim 51, in which at least one of said at least two vertical passages is connected to a container for storing rinsing fluid.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 36-37 and 39-43, 45-55 are rejected under 35 U.S.C. 102(e) as being anticipated by Natarajan et al. US 6,955,777

The applied reference has a common inventor with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Natarajan et al. disclose a structure formed using 3 green sheets and 1 horizontal channel connecting two vertical wells for simplicity in illustration. The structure has been assembled from individual sheets by lamination. The assembly process is the same for ceramic structures with arrays of thousands of holes, with thousands of horizontal channels selectively connected to link vertical holes. The ceramic material may include alumina, glass ceramic, aluminum nitride, borosilicate glass and glass. The diameter of vertical wells can be 20 microns or more, the channel width can be 20 microns or more and the length can be a minimum of 20 microns. The shape of a well exposing a substance may be circular, rectangular, smooth or rough. The total thickness of the plate 10 may be any desired amount, but preferably is under 1 mm. The thickness of the greensheet depends on the application, but preferably ranges from about 3 mils to about 30 mils.

The technique for forming vertical apertures and horizontal channels is material removal by techniques such as punching the material out including nibbling, laser drilling, e-beam drilling, sandblasting and high pressure liquid jets.

Additionally, the material in the passages may be one that forms a non-porous sheath on being sintered, so that the passages receive a liner.

The reference clearly encompasses the method of the cited claims.

5. Claims 40-49, 51, and 55 are rejected under 35 U.S.C. 102(b) as being anticipated by Trickett et al., US 4,833,000.

Trickett et al. disclose a method of preparing ceramic monolithic structures with an internal cavity and passageways is described. A thin sheet of a ceramic material is

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formed by spreading the material on a glass plate with a doctor blade. Individual sheets of the material are cut or punched to form predetermined holes, channels or various shapes therein. These individual sheets are then stacked to form a layered structure. A supporting media such as paraffin wax is injected into the holes and channels to completely fill them with the media. The layered structure is then pressed by unipressing and/or isostatic pressing followed by a prefiring step to remove the supporting media. Once the supporting media had been completely removed, the layered structure is then sintered to form a monolithic structure containing precise predetermined internal cavity and passageways (abstract).

The layered structure having a surface and a cavity contained therein is formed by stacking individual sheets of a ceramic material. Predetermined individual sheets having apertures therein. The individual sheets are stacked in a predetermined sequence to form a layered structure having a passageway and a cavity therein. The layered structure formed by the stacking of the individual sheets has a surface and a cavity connected to the surface thereof by a passageway. a layered structure having a surface and a cavity contained therein is formed by stacking individual sheets of a ceramic material. Predetermined individual sheets having apertures therein. The individual sheets are stacked in a predetermined sequence to form a layered structure having a passageway and a cavity therein. The layered structure formed by the stacking of the individual sheets has a surface and a cavity connected to the surface thereof by a passageway.



In FIG. 1 an exploded perspective view of a layered structure 10 depicting individual sheets of ceramic material 20, 21, 22, made by forming a large sheet of a ceramic material, such as alumina, lanthana, yttria, magnesia, aluminum oxynitride, silicon nitride, and magnesium aluminate or combinations thereof which was cut into individual sheets 20, 21, and 22. Predetermined individual sheets were punched or cut out to form apertures 23 and 24 of individual sheets 20 and 21, respectively.

The finished monolithic lanthana doped yttria structure has a domed shape with passageways and a cavity to facilitate cooling and is transparent to infrared.

The product may also be pressed sufficiently to form a layered structure.

The ceramic sheets from which the layers are cut are from about 1 mil to about 100 mils thick.

The reference clearly encompasses the method of the cited claims.

***Claim Rejections - 35 USC § 103***

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 38 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Natarajan et al.

Natarajan et al. do not disclose a source of rinsing liquid.

It would have been obvious to one of ordinary skill in the art at the time of the invention to recognize the structure would be required to be washed/rinsed in between usages to avoid cross contamination.



***Response to Arguments***

8. Applicant's arguments with respect to claims 36-56 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Alm et al. discloses the development of ceramic heat exchangers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



brg

BRIAN R. GORDON  
PRIMARY EXAMINER